Active OB stars: structure, evolution, mass loss and critical limits
Proceedings IAU Symposium No. 272, 2010
C. Neiner, G. Wade, G. Meynet & G. Peters, eds.

DOI: 00.0000/X000000000000000X

The IACOB spectroscopic database of Galactic OB stars

S. Simón-Díaz[1,2], N. Castro[1,2], M. Garcia[1,2] and A. Herrero[1,2]

[1]Instituto de Astrofísica de Canarias, E-38200 La Laguna, Tenerife, Spain
[2]Departamento de Astrofísica, Universidad de La Laguna, E-38205 La Laguna, Tenerife, Spain.

Abstract. We present the IACOB spectroscopic database, the largest homogeneous database of high-resolution, high signal-to-noise ratio spectra of Northern Galactic OB-type stars compiled up to date. The spectra were obtained with the FIES spectrograph attached to the Nordic Optical Telescope. We briefly summarize the main characeristics and present status of the IACOB, first scientific results, and some future plans for its extension and scientific exploitation.

Keywords. Stars: early-type – Techniques: spectroscopic – Catalogs – Astronomical data bases: miscellaneous –

1. Introduction

In an epoch in which we count with a new powerful generation of stellar atmopshere codes including all the important physics for the modelling of massive OB stars, with (clusters of) high efficiency computers allowing the computation of large grids of stellar models in more than reasonable computational times, and with the possibility to obtain good quality, medium resolution spectra of hundreds O and B-type stars in clusters outside the Milky way in just one snapshot (see e.g. the *FLAMES I & II Surveys of Massive Stars*, Evans et al. 2008, 2010; see also Lennon et al., these proceedings), the compilation of medium and high-resolution spectroscopic databases of OB stars in our Galaxy is becoming more and more important. With this idea in mind, two years ago we began to compile the IACOB spectroscopic database, aiming at constructing the largest database of multiepoch, high resolution, high signal-to-noise ratio (S/N) spectra of Galactic Northern OB-type stars. The IACOB perfectly complements the efforts also devoted in the last years by the GOSSS (P.I. Maíz-Apellaniz; see also Sota et al., these proceedings) and the OWN (P.I's Barbá & Gamen, leading a multi-epoch, high-resolution spectroscopic survey of Galactic O and WR stars in the Southern hemisphere; see Barbá et al. 2010) teams.

2. Characteristics of the IACOB and present status

We are using the FIES spectrograph† at the 2.56 m Nordic Optical Telescope (NOT) in the Roque de los Muchachos observatory (La Palma, Spain) to compile spectra for the IACOB. A summary of the instrumental configuration and observing dates (before Sept. 2010) is presented in Table 1. Spectra of ∼100 stars with spectral types earlier than B2 and luminosity classes ranging from I (Supergiants) to V (Dwarfs) have already been compiled. The O-type targets were selected among those stars with $V \leqslant 8$ included in the GOS catalogue (GOSC, Maíz-Apellániz et al. 2004). The main part of the B-type stars sample correspond to the works presented in Simón-Díaz (2010) and Simón-Díaz et al. (2010). The final spectra normally have S/N $\geqslant$ 200.

† Detailed information about the NOT and FIES can be found in http://www.not.iac.es

Table 1. General characteristics of the IACOB v1.0 spectroscopic database.

Instrumental configuration		Observing run & Dates	
Telescope: NOT2.56 m	Spect. range: 3800 - 7000 Å	08 A-D: 2008/11/05-08,	10 D: 2010/06/22
Instrument: FIES	Res. power: 46000	09 A-D: 2009/11/09-12,	10 E: 2010/07/15
Mode: med-res	Sampling: 0.03 Å/pix	10 A-C: 2010/06/05-07,	10 F: 2010/08/07
Spectral types: O4-B2 (I-V)		# stars: 105	# spectra: 720

3. Some scientific results using spectra from the IACOB

There are already two published papers using data from the IACOB (and several more in preparation). In Simón-Díaz (2010), we used the stellar atmosphere code FASTWIND (Puls et al. 2005) to perform a thorough self-consistent spectroscopic analysis of 13 early B-type stars from the various subgroups comprising the Orion OB1 association; this study showed that the dispersion of O and Si abundances between stars in the various subgroups found in previous analyses (e.g. Cunha & Lambert 1992) was a spurious result, being the consequence of a bad characterization of the abundance errors propagated from the uncertainties in the stellar parameter determination. In Simón-Díaz et al. (2010) we showed the first observational evidence for a correlation between macroturbulent broadening and line-profile variations in OB Supergiants using spectroscopic time series for a sample of 13 OB Sgs; this may support the hypothesis that macroturbulent broadening in this type of stars is likely a result of the collective effect of stellar pulsations. A subsample of IACOB spectra has been used within the *FLAMES-II Survey of Massive Stars: the Tarantula Survey* consortium to construct an atlas of medium resolution spectra of Galactic OB-type stars (Sana et al. in prep.). We plan to use this atlas for the spectral classification of the massive stars in 30 Dor. Finally, the scientific exploitation of the IACOB spectra concerning the quantitative spectroscopic analysis of the stars has already began and a series of papers with results will be published soon (see more details in the paper devoted to the presentation of the IACOB database Simón-Díaz et al., in prep.).

4. Future plans for the IACOB

In the next semesters, we will continue with the compilation of spectra for the IACOB, observing stars with V$\leqslant$8 in at least three epochs (more in the case of known or newly detected binaries). Our idea is to make public the database via the Virtual Observatory in the next year. In the meantime, interested people can have access to the database under request to the author (`ssimon@iac.es`). The complete list of stars will be published in Simón-Díaz et al., in prep.. We will acknowledge any observer who having obtained FIES spectra will like to add the spectra to the IACOB database after scientific exploitation.

References

Barbá, R. H., et al. 2010, *Rev. Mexicana AyA*, 38, 30
Cunha, K., & Lambert, D. L. 1992, *ApJ*, 399, 586
Evans, C. J., et al. 2008, *The Messenger*, 131, 25
Evans, C. J., et al. 2010, in: R. de Grijs and J. Lepine (eds.), *Star clusters: basic galactic building blocks throughout time and space*, Proc. IAU Symposium No. 266, (CUP), p. 35
Maíz-Apellániz, J., Walborn, N. R., Galué, H. Á., & Wei, L. H. 2004, *ApJS*, 151, 103
Puls, J., et al. 2005, *A&A*, 435, 669
Simón-Díaz, S. 2010, *A&A*, 510, 22
Simón-Díaz, et al. 2010, *ApJ* (Letters), 720, L174